TM 11-6625-418-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL

TEST SET, RADIO AN/ARM-51

HEADQUARTERS, DEPARTMENT OF THE ARMY
2 MARCH 1961

WARNING

Be careful when working on the 27.5-volt dc power supply connections. Serious injury to personnel may result if contact with this power is made.

DON'T TAKE CHANCES!

TECHNICAL MANUAL
NO. 11-6625-418-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *2 March 1961*

TEST SET, RADIO AN/ARM-51

			Paragraph	Page
CHAPTER	1.	INTRODUCTION		
Section	I.	General		
		Scope	1	3
		Forms and records	2	3
	II.	Description and data		
		Purpose and use	3	3
		Technical characteristics	4	4
		Components	5	4
		Common names	6	4
		Description of Test Set, Radio AN/ARM-51	7	5
		Description of Test Set, Radio TS-1474/ARM-51	8	5
		Description of Control, Radio Set C-1827/ARC-55	9	5
		Description of minor components	10	5
		Additional equipment required	11	6
CHAPTER	2.	SERVICE UPON RECEIPT OF EQUIPMENT		
		Unpacking	12	7
		Checking unpacked equipment	13	7
CHAPTER	3.	OPERATING INSTRUCTIONS		
Section	I.	Operator's controls, indicators, and connectors		
		Test set controls, indicators, and connectors	14	9
		Radio set control, operating controls	15	12
	II.	Operation		
		Preliminary control settings	16	13
		Checking installed radio set control and associated aircraft wiring	17	13
		Checking radio set in aircraft	18	16
		Bench – checking radio set	19	19
		Special operating procedures	20	19
		Stopping procedure	21	21
CHAPTER	4.	ORGANIZATIONAL MAINTENANCE INSTRUCTIONS		
		Scope of maintenance instructions	22	22
		Tools and materials required	23	22
		Preventive maintenance	24	22
		Visual inspection	25	22
		Equipment performance checklist	26	25
		Removal and replacement of radio set control	27	27
		Removal and replacement of indicator and panel lamps	28	27
CHAPTER	5.	SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE		
Section	I.	Shipment and limited storage		
		Disassembly of equipment	29	29
		Repackaging for shipment or limited storage	30	29
	II.	Demolition of material to prevent enemy use		
		Authority for demolition	31	29
		Methods of destruction	32	29
APPENDIX	I.	REFERENCES		30
	II.	MAINTENANCE ALLOCATION		31
	III.	BASIC ISSUE ITEMS LIST		36

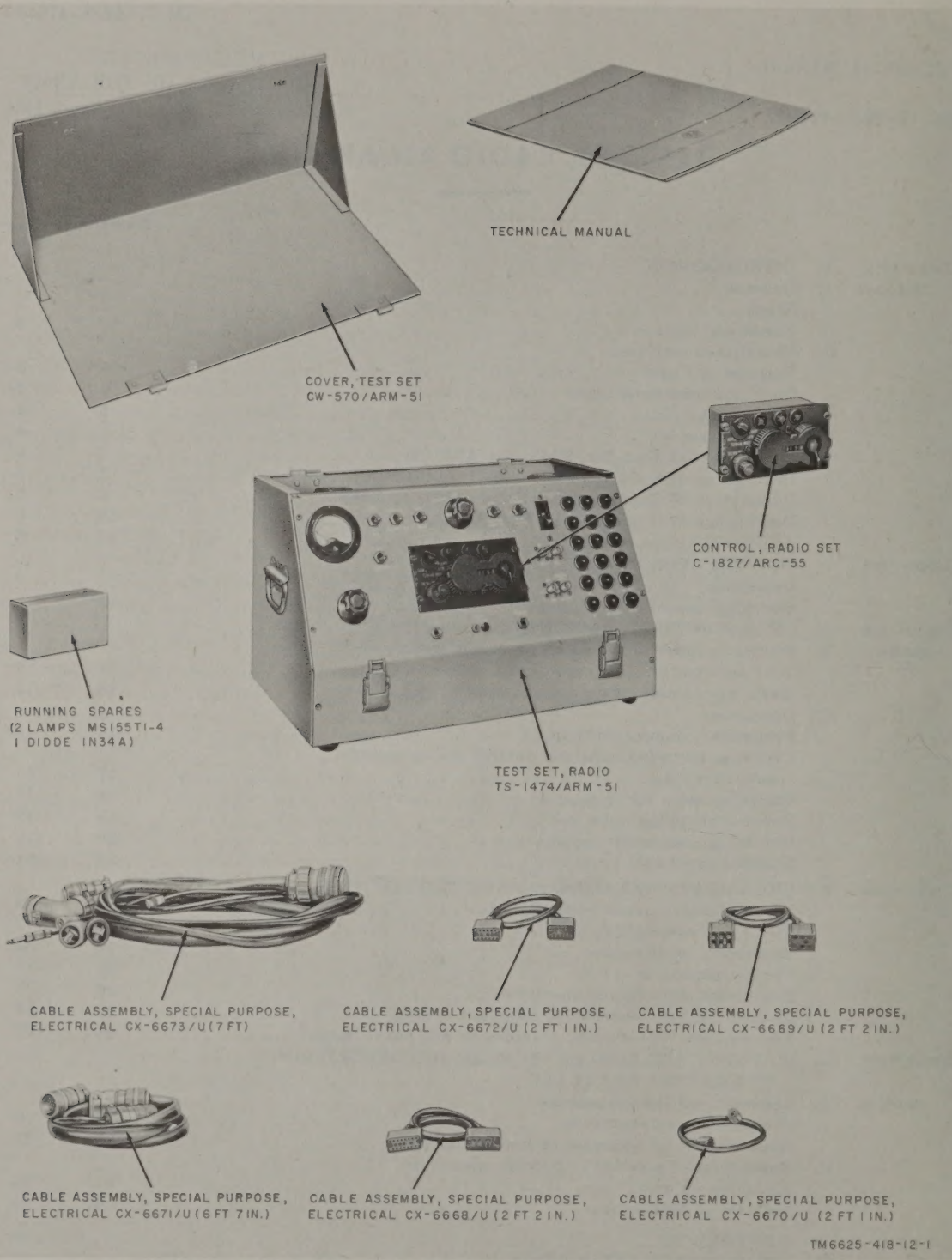


Figure 1. Test Set, Radio AN/ARM–51.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

This manual describes Test Set, Radio AN/ARM-51 (fig. 1) and covers its operation and first and second echelon maintenance. The manual also includes procedures for the replacement of parts available to first and second echelons.

2. Forms and Records

a. Unsatisfactory Equipment Reports.

(1) Fill out and forward DA Form 468 (Unsatisfactory Equipment Report) to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-ML, Fort Monmouth, N. J., as prescribed in AR 700-38.

(2) Fill out and forward AF TO Form 29 (Unsatisfactory Report) to the Commander, Air Materiel Command, Wright-Patterson Air Force Base, Ohio, as prescribed in AF TO 00-35D-54.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army) and AFR 71-4 (Air Force).

c. Preventive Maintenance Forms. Prepare DA Form 11-266 (Maintenance Check List for Signal Equipment (Test Equipment)) in accordance with instructions on the form (fig. 7 and 8).

d. Parts List Form. Forward DA Form 2028 (Recommended Changes to DA Technical Manual Parts List or Supply Manual 7, 8, or 9) direct to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-ML, Fort Monmouth, N. J., with comments on parts listing in appendixes II and III.

e. Comments on Manual. Forward all other comments on this manual direct to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-PA2d, Fort Monmouth, N. J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

a. Purpose. Test Set, Radio AN/ARM-51 is a portable test equipment designed to check circuit continuity, voltages, and currents within components of the radio sets (*b* below). Continuity of particular circuits is indicated by the indicator lamps; voltage and current measurements are provided by a meter and its associated switch located on the front panel of Test Set, Radio TS-1474/ARM-51. The AN/ARM-51 controls and facilitates the interconnection of power, audio-signal, and radiofrequency (rf) signal sources to these radio sets for making operational tests, adjustments, alignments, and troubleshooting. Also, the AN/ARM-51 facilitates the interconnections of a headset (for aural monitoring) and an oscilloscope (for visual monitoring) to the radio set under test to provide extended test capabilities for the radio set. Extension cables are provided for making connection between any removed subassembly and the main chassis of the radio set receiver-transmitter for circuit checks and troubleshooting of the subassembly.

b. Use. Test Set, Radio AN/ARM-51 can be used in an aircraft or on a workbench to check, test, and troubleshoot the following radio sets as well as individual components of these radio sets.

(1) Radio Sets AN/ARC-27 and AN/ARC-27A.

(2) Radio Sets AN/ARC-55 and AN/ARC-55B.

4. Technical Characteristics

Indicating devices:

Indicating devices:	
Lamps	18, indicate continuity of circuits within the radio set under test.
Meter	0-1 ma, measures currents and voltages in the radio set.
Meter accuracy	±2-1/2% full-scale deflection.
Dummy load attenuation:	
RF HIGH connector	7.1 db.
RF MED connector	13.8 db.
RF LOW connector	23 db.
Connector impedance:	
1,000 CYCLES	300 ohms (approx).
RF LOW	24 ohms.
RF MED	33 ohms.
RF HIGH	42 ohms.
Power requirements with a radio set connected for test:	
Standby	27.5 vdc at 12.5 amp.
Operate	27.5 vdc at 25 amp max.
Weight	30.25 pounds.

5. Components

a. Test Set, Radio AN/ARM-51 (fig. 1).

Quantity	Item	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
1	Test Set, Radio TS-1474/ARM-51	10-3/4	11	18	16.875
1	Control, Radio Set C-1827/ARC-55	3	4-1/4	5-3/4	1.75
1	Cover, Test Set CW-570/ARM-51	7-1/2	11	18	4.0
1	Cable assembly, Special Purpose, Electrical CX-6673/U (7 ft)	84 (lg)			4.0
1	Cable Assembly, Special Purpose, Electrical CX-6671/U (6 ft 7 in.)	79 (lg)			2.0
1	Cable Assembly, Special Purpose, Electrical CX-6669/U (2 ft 2 in.)	26 (lg)			0.625
1	Cable Assembly, Special Purpose, Electrical CX-6668/U (2 ft 2 in.)	26 (lg)			0.5
1	Cable Assembly, Special Purpose, Electrical CX-6672/U (2 ft 1 in.)	25 (lg)			0.375
1	Cable Assembly, Special Purpose, Electrical CX-6670/U (2 ft 1 in.)	25 (lg)			0.125
1 set	Running spares (*b* below)				

b. Running Spares.

Quantity	Item
2	Lamp, MS15571-4
1	Diode, 1N34A

6. Common Names

A list of common names for Test Set, Radio AN/ARM-51 and its components is given below.

Nomenclature	Common name
Test Set, Radio AN/ARM-51	Radio test set
Test Set, Radio TS-1474/ARM-51	Test set
Control, Radio Set C-1827/ARC-55	Radio set control
Cover, Test Set CW-570/ARM-51	Test set cover

7. Description of Test Set, Radio AN/ARM–51
(fig. 1)

Test Set, Radio AN/ARM-51 is portable and can be used wherever 27.5 volts direct-current (dc) power is available. This radio test set consists of a Test Set, Radio TS-1474/ARM-51, a Control, Radio Set C-1827/ARC-55, a Cover, Test Set CW-570/ARM-51, and six cable assemblies (Cable Assemblies, Special Purpose, Electrical CX-6668/U through CX-6673/U). When the test set cover is raised or removed, the storage compartment which contains the cable assemblies and the sloping front panel which contains the radio set control are exposed.

8. Description of Test Set, Radio TS–1474/ARM–51
(fig. 1)

Test Set, Radio TS-1474/ARM-51 contains 18 indicator lamps, a meter, controls, and connectors that are used in operational checks of the equipment listed in paragraph 3*b*. All of these items, except three of the connectors, are located on the sloping front panel. The three remaining connectors are located on a recessed top shelf. An opening in the sloping front panel is for installing the radio set control. A pendant cable, in the test set, provides all circuit connections between the radio set control and the test set. A compartment at the rear of the test set provides storage space for the six cable assemblies.

9. Description of Control, Radio Set C–1827/ARC–55
(fig. 1)

Control, Radio Set C-1827/ARC-55 mounts in the front panel of the test set. Three frequency selectors on the radio set control permit manual selection of a desired frequency on the radio set under test. The front panel also contains a function selector switch, an audio volume control, and a receiver sensitivity control. Three panel lights provide illumination for the radio set control front panel.

10. Description of Minor Components
(fig. 1)

a. Cover, Test Set CW-570/ARM-51. The test set cover confines items stored in the compartment at the rear of the test set and protects the sloping front panel of the test set during transit. The test set cover is mounted by two hinges at the top rear of the test set. It is secured with two latches located on the lower front of the test set.

b. Cable Assembly, Special Purpose, Electrical CX-6673/U (7 ft). The CX-6673/U is a multipurpose cable used to connect the primary power source to the test set and the radio set under test. It also provides interconnection of rf, audio-frequency (af), and control circuits between the test set and the radio set under test. The CX-6673/U contains 29 single conductors and 1 rf coaxial conductor. A 35-contact plug and an rf coaxial plug, at one end of the cable, connect to the test set. A 16-contact plug, a 16-contact receptacle, a phone plug, and an rf coaxial plug, at the second end of the cable, connect to the radio set. Two battery clips, at the third end of the cable, connect to the power source.

c. Cable Assembly, Special Purpose, Electrical CX-6671/U (6 ft 7 in.). The CX-6671/U provides interconnection between the test set and the radio set control installed in the aircraft and aircraft wiring under test. The CX-6671/U contains 18 single conductors. A 23-contact plug at one end of the cable connects to the test set. Two 16-contact receptacles at the second end connect to the aircraft wiring.

d. Cable Assembly, Special Purpose, Electrical CX-6669/U (2 ft 2 in.). The CX-6669/U is an extension cable that provides interconnection between the main chassis of the radio set under test and its dynamotor when the dynamotor is removed from the chassis. The CX-6669/U contains six single conductors. A six-contact plug at one end of the cable connects to the chassis of the radio set and six-contact receptacle at the second end connects to the dynamotor.

e. Cable Assembly, Special Purpose, Electrical CX-6668/U (2 ft 2 in.). The CX-6668/U is an extension cable that provides interconnection between the main chassis of the radio set under test and four of its subassemblies (modulator, intermediate-frequency (if.) and audio amplifier, bias relay, and mechanical drive) when they are removed from the chassis. The CX-6668/U contains 20 single conductors. A 20-contact plug at one end of the cable connects to the chassis receptacle in the radio set for the removed subassembly and a 20-contact receptacle at the second end connects to the removed subassembly.

f. Cable Assembly, Special Purpose, Electrical CX-6672/U (2 ft 1 in.). The CX-6672/U is an extension cable that provides interconnection between the main chassis of the radio set under test and four of its subassemblies (guard receiver, 20- to 30-megacycle (mc) if. amplifier, spectrum amplifier, and rf power amplifier) when they are removed from the chassis. The CX-6672/U contains 15 single conductors. A 15-contact plug at one end of the cable connects to the chassis receptacle in the radio set for the removed subassembly and a 15-contact receptacle at the second end connects to the removed subassembly.

g. Cable Assembly, Special Purpose, Electrical CX-6670/U (2 ft 1 in.). The CX-6670/U is an extension cable that provides interconnection between the main chassis of the radio set under test and two of its subassemblies (main receiver rf amplifier and spectrum oscillator) when they are removed from the chassis. The CX-6670/U contains seven single conductors. A seven-contact plug at one end of the cable connects to the chassis receptacle in the radio set for the removed subassembly and a seven-contact receptacle at the second end connects to the removed subassembly.

11. Additional Equipment Required

The following equipment is not supplied as part of Test Set, Radio AN/ARM-51, but is required for use with it.

a. Power Supply. A 27.5-volt dc power supply is required to furnish a maximum of 25 amperes to the radio test set. When using the radio test set in the aircraft, connect it to the aircraft electrical system and operate it by using power from the aircraft battery or an auxiliary power unit. When using the radio test set on a bench, use Power Supply PP-1104/AG, or equivalent.

b. Microphone. A carbon microphone (Microphone, Carbon T-17 or equivalent) is required to key and modulate the transmitter of the radio set under test.

c. Headset. A headset with at least 300 ohms impedance (Headset HS-33 or equivalent) is required to monitor the radio set receiver output and transmitter sidetone.

d. Audio Oscillator. An audio oscillator (Audio Oscillator TS-382C/U or equivalent) is required to supply a 1,000-cycle-per-second (cps) modulation signal.

e. Signal Generator. A signal generator (Signal Generator TS-497/URR or equivalent) is required to supply an rf test signal in the 225.0- to 399.9-mc frequency range.

f. Oscilloscope. An oscilloscope (Oscilloscope OS-8C/U or equivalent) is required to visually monitor the modulation characteristics of the radio set transmitter.

g. Multimeter. A multimeter (Multimeter AN/URM-105 or equivalent) is required to make voltage and resistance measurements in the radio set under test and within the aircraft.

CHAPTER 2

SERVICE UPON RECEIPT OF EQUIPMENT

12. Unpacking
(fig. 2)

a. Packaging Data. When packed for shipment, the radio test set is packed in a corrugated carton 14-1/4 by 14-1/2 by 21-1/2 inches. The unit weight is 32 pounds and the volume is 2.57 cubic feet.

b. Removing Contents.

(1) Open the corrugated carton.

(2) Remove the corrugated filler pads from above and at the sides of the equipment.

(3) Carefully lift the radio test set from the carton.

(4) Open the radio test set, remove the test set cover, and remove the technical manual, running spares, and cables from the compartment at the rear of the test set.

13. Checking Unpacked Equipment

a. Inspect the equipment and running spares for signs of possible damage incurred during shipment. If the equipment is damaged, refer to paragraph 2*b*. Check DA Pamphlet 310-4 for the latest modification work orders (MWO's) on the radio test set. If the equipment has been used or reconditioned, see if it has been changed by the latest MWO's. If modified, the MWO number will appear on the equipment near the nomenclature plate.

b. Check the equipment against the packing list. When no packing list accompanies the equipment, use the table of components (para 5) as a general check. If the equipment is incomplete, refer to paragraph 2*b*.

c. Check to be sure the radio set control is correctly installed in the test set. To make this check, remove the radio set control from the test set, secure the connector at the rear of the radio set control (if necessary), and replace the radio set control (para 27).

d. Place the running spares in the storage compartment at the rear of the test set. If the radio test set is not to be used immediately, place the cable assemblies and the technical manual in the storage compartment and replace and close the test set cover.

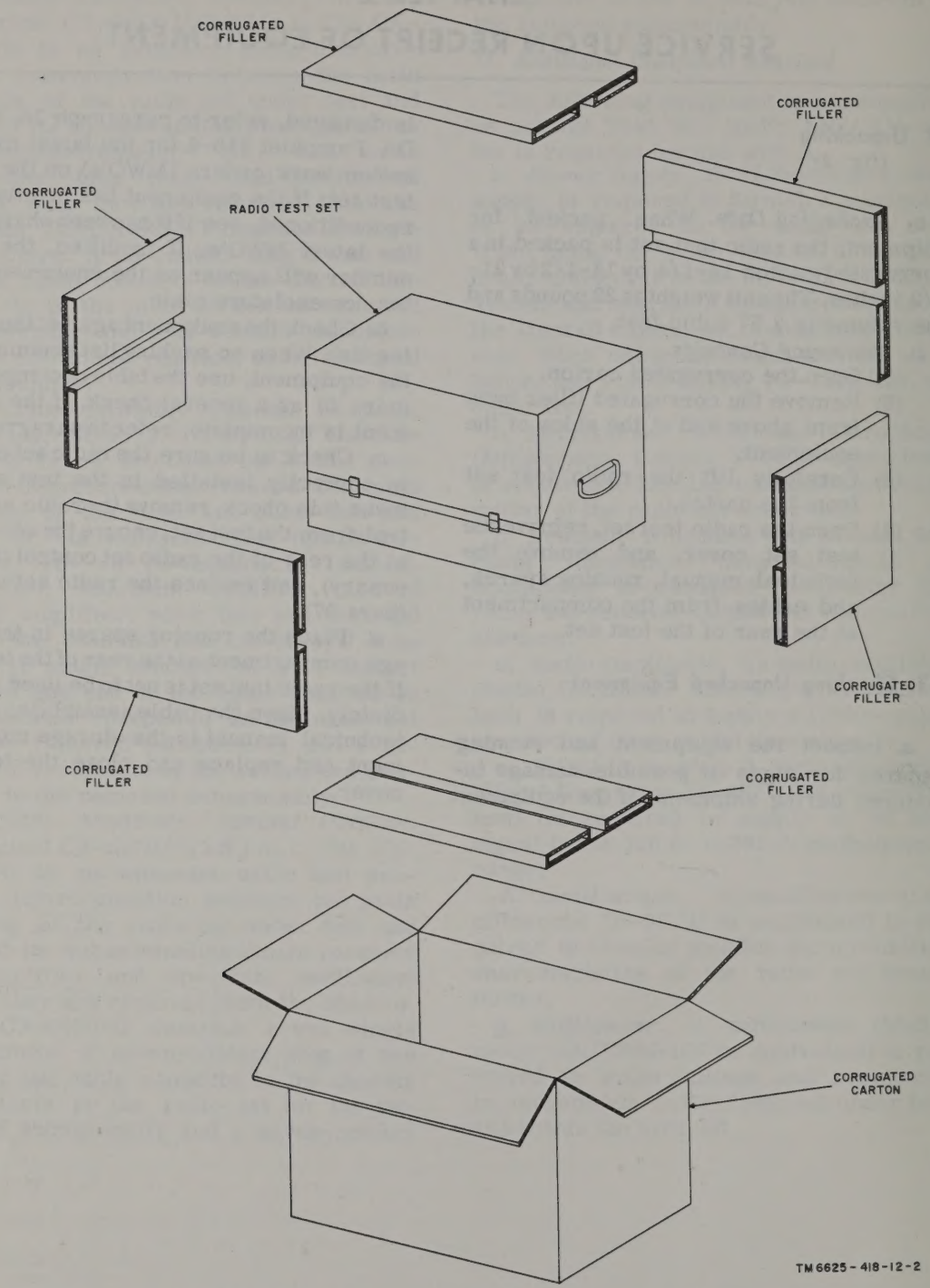


Figure 2. Typical packaging diagram.

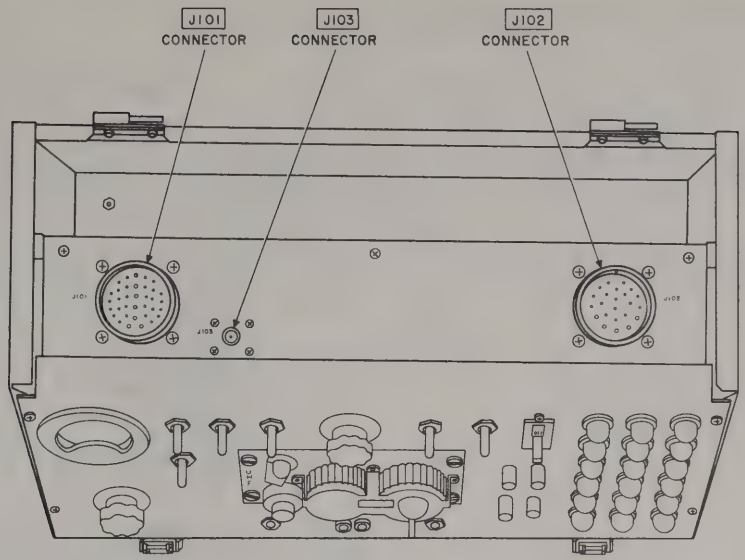
CHAPTER 3
OPERATING INSTRUCTIONS

Section I. OPERATOR'S CONTROLS, INDICATORS, AND CONNECTORS

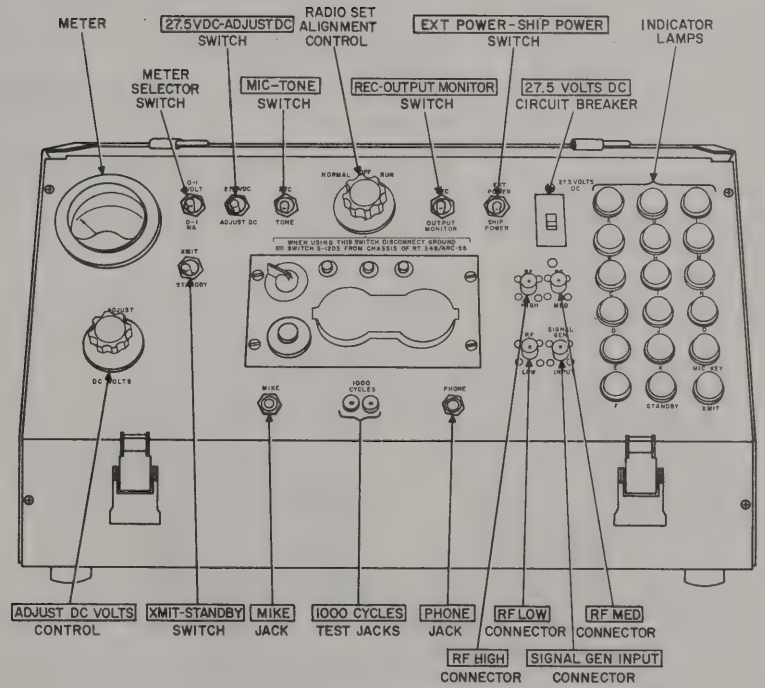
14. Test Set Controls, Indicators, and Connectors (fig. 3)

Control, indicator, or connector	Function
27.5 VOLTS DC circuit breaker	A 30-ampere circuit breaker that connects primary power from the source to the radio set under test and circuits in the test set.
EXT POWER-SHIP POWER switch	EXT POWER position: supplies 27.5 volts dc to indicator lamp circuit from an external power source. SHIP POWER position: supplies 27.5 volts dc to indicator lamp circuit from the aircraft circuits.
27.5 VDC-ADJUST DC switch	27.5 VDC position: supplies full input voltage to radio set und under test. ADJUST DC position: places ADJUST DC VOLTS control in series with voltage input to radio set under test.
ADJUST DC VOLTS control	Reduces input voltage level to the radio set under test, for testing under low input voltage conditions.
Meter	Monitors either of the circuits selected by the meter selector switch.
Meter selector switch	0-1 MA position: connects meter to METER jack on radio set under test. 0-1 VOLT position: connects meter to 1000 CYCLES test jacks.
1000 CYCLES test jacks	Connectors for an external 1-kc modulation test signal.
Indicator lamps	Indicator lamps A through 0 (fig. 9) light in combinations as indicated in paragraph 17*b*. The combination depends on the position of the selector controls on the radio set control under test. The STANDBY indicator lamp lights when primary power is applied to the radio set under test but the transmitter in the radio set is not keyed. The XMIT indicator lamp lights when primary power is applied to the radio set under test and the transmitter in the radio set is keyed. The MIC KEY indicator lamp lights when primary power is applied and the transmitter is keyed by pressing the push-to-talk button on a microphone connected to the microphone jack installed in the aircraft.
XMIT-STANDBY switch	In XMIT position with primary power applied, the transmitter in the radio set under test is keyed continuously. In STANDBY position with primary power applied, the transmitter may be keyed by pressing the push-to-talk button on a microphone connected to the MIKE jack.
MIKE jack	Connects a microphone to the transmitter in the radio set under test.
PHONE jack	Connects a headset to the receiver in the radio set under test.
REC-OUTPUT MONITOR switch	REC position: connects the output of the receiver in the radio set under test to the PHONE jack. OUTPUT MONITOR position: connects the sidetone output from the dummy load to the PHONE jack.
MIC-TONE switch	MIC position: connects MIKE jack to transmitter microphone input of the radio set under test. TONE position: connects 1000 CYCLES jack to transmitter microphone input of the radio set under test and keys the transmitter.
Radio set alignment control (3-position rotary switch)	Energizes frequency selector circuits in the radio set during alignment procedures.

Control, indicator, or connector	Function
	NORMAL position: causes the radio set under test to operate on the frequency selected on the radio set control mounted on the test set front panel. OFF position: removes energizing voltage from the frequency selector circuits in the radio set under test. RUN position: drives the capacitor plates on three subassemblies (main receiver rf amplifier, spectrum amplifier, and rf power amplifier) of the radio set under test to accessible positions for alignment procedures. In this position, the switch is spring-loaded to return to OFF.
SIGNAL GEN INPUT connector.....	Connects the output of an external signal generator to the radio set under test.
RF LOW connector	Provides a low-impedance rf connection for monitoring the modulation of the transmitter output signal from the radio set under test.
RF MED connector	Provides a medium-impedance rf connection for monitoring the modulation of the transmitter output signal from the radio set under test.
RF HIGH connector	Provides a high-impedance rf connection for monitoring the modulation of the transmitter output signal from the radio set under test.
J101 connector	Provides a connection for the primary power source and the radio set under test.
J102 connector	Provides a connection for the aircraft wiring circuits under test.
J103 connector.....	Provides a connection for rf signals from the radio set under test.



A. TOP VIEW



B. FRONT VIEW

TM6625-418-12-3

Figure 3. Test set controls, indicators, and connectors.

15. Radio Set Control, Operating Controls
(fig. 4)

Control	Function
Function switch (a 4-position rotary switch)	Controls the primary power to the radio set under test and selects the mode of operation. *Position* — *Function* OFF — Opens the primary power control circuit to the radio set under test. T/R — Closes the primary power control circuit to the radio set under test. T/R + G REC — Closes the primary power control circuit to the radio set under test and also turns on the guard receiver in this radio set. ADF — This position is not used with the radio set control installed in the radio test set.
10-megacycle selector	One of the three manual decade frequency selectors that permit selection of any frequency within the frequency range of the radio set under test. This control selects the frequencies between 200- and 390-megacycles in 10-megacycle increments.
Whole-megacycle selector	One of the three manual decade frequency selectors that permit selection of any frequency within the frequency range of the radio set under test. This control selects the units digit of the frequency between 0- and 9-mc in 1-megacycle increments.
1/10-megacycle selector	One of the three manual decade frequency selectors that permit selection of any frequency within the frequency range of the radio set under test. This control selects the tenths digit of the frequency between 0.0- and 0.9-mc in 1/10th megacycle increments.
SENS control	Controls the receiver sensitivity level (rf gain) above that sensitivity level selected by the SENS control on the radio set under test.
VOL control	Adjusts the amplitude of the receiver af output signals, from the radio set under test, that are applied to the headset circuit.

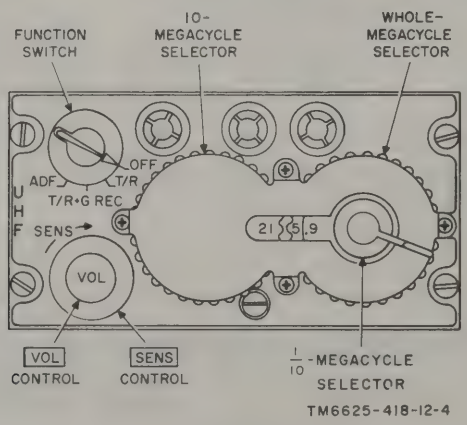


Figure 4. Radio set control, controls and indicators.

16. Preliminary Control Settings

Before performing the operating procedures (para 17 through 20), check the positions of all controls on the test set and the radio set control. Make sure all controls are in the proper positions as indicated in the following charts (*a* and *b* below).

a. Test Set Controls (fig. 3).

Control	Position
27.5 VOLTS DC circuit breaker.	OFF
EXT POWER-SHIP POWER switch	SHIP POWER
27.5 VDC-ADJUST DC switch...	27.5 VDC
ADJUST DC VOLTS control.....	Fully clockwise
Meter selector switch	0-1 MA
XMIT-STANDBY switch.....	STANDBY
REC-OUTPUT MONITOR switch .	REC
MIC-TONE switch	MIC
Radio set alignment control	NORMAL

b. Radio Set Control (fig. 4).

Control	Position
Function switch	OFF
SENS control	Center of its range
VOL control	Center of its range

17. Checking Installed Radio Set Control and Associated Aircraft Wiring (fig. 5)

a. Preliminary Operating Procedures.

(1) Locate the radio test set near the front of the radio set that is installed in the aircraft. Remove the test set cover and all cables from the test set, and then perform the preliminary control settings (para 16).

(2) Connect connector P102 of cable CX-6671/U (6 ft 7 in.) to connector J102 (fig. 3) on the recessed top shelf of the test set.

(3) Disconnect aircraft cabling connectors P1401 and P1403 from connectors J1401 and J1403 on the front panel of the radio set installed in the aircraft.

(4) Connect connector P113 of cable CX-6771/U to aircraft cabling connector P1401.

(5) Turn on the aircraft power. Refer to the applicable aircraft technical manual for the procedure of applying primary power to Radio Set AN/ARC-55.

(6) Using a multimeter (para 11*g*), measure the dc voltage at pins P and N of aircraft cabling connector P1403, then connect aircraft cabling connector P1403 to connector P112 of cable CX-6671/U.

(7) If 27.5 volts dc was present at pins P and N of aircraft cabling connector P1403, in (6) above, leave the EXT POWER-SHIP POWER switch (fig. 3) in the SHIP POWER position and proceed to the operating procedures (*b* below).

(8) If 27.5 volts dc was not present during the step in (6) above, connect connector P101 of cable CX-6673/U (7 ft) to connector J101 (fig. 3) on the recessed top shelf of the test set. Connect clips P110 (red) and P111 (black) to an external 27.5-volt dc power supply; observe the polarity. Place the EXT POWER-SHIP POWER switch to EXT POWER, and place the 27.5 VOLTS DC circuit breaker to ON. Proceed with the operating procedures (*b* below).

b. Frequency Selector Control Circuit Test. Check the radio set control in the aircraft by setting its three manual decade frequency selectors (10-megacycle, whole-megacycle, and 1/10-megacycle) to various frequencies while observing the combination of lighted indicator lamps on the

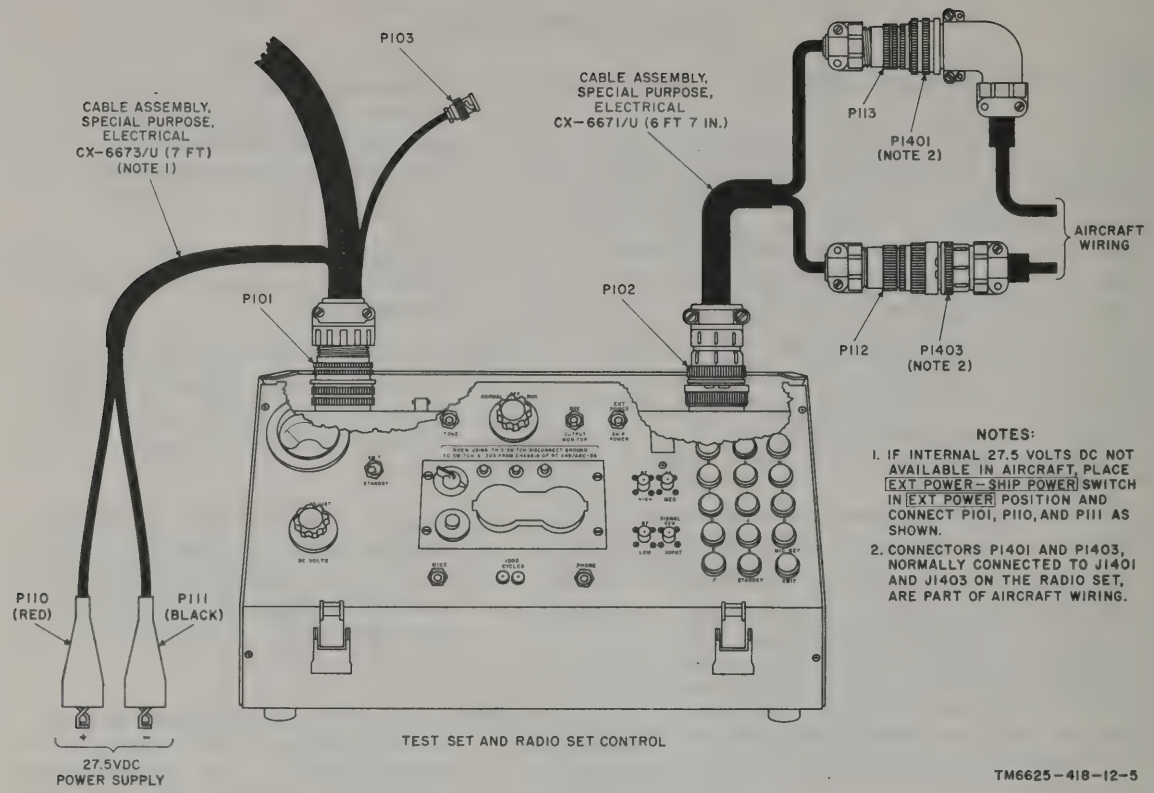

P103
CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-6673/U (7 FT) (NOTE 1)
CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-6671/U (6 FT 7 IN.)
P113
P1401 (NOTE 2)
AIRCRAFT WIRING
P101
P102
P112
P1403 (NOTE 2)
NOTES:
1. IF INTERNAL 27.5 VOLTS DC NOT AVAILABLE IN AIRCRAFT, PLACE EXT POWER-SHIP POWER SWITCH IN EXT POWER POSITION AND CONNECT P101, P110, AND P111 AS SHOWN.
2. CONNECTORS P1401 AND P1403, NORMALLY CONNECTED TO J1401 AND J1403 ON THE RADIO SET, ARE PART OF AIRCRAFT WIRING.
P110 (RED)
P111 (BLACK)
27.5VDC POWER SUPPLY
TEST SET AND RADIO SET CONTROL
TM6625-418-12-5

Figure 5. Radio Set control in aircraft and aircraft wiring test, cording diagram.

test set. The frequency setting and the combination of lighted indicator lamps are as follows:

(1) Set the 10-megacycle selector to each frequency listed in the following chart and observe that all of the indicator lamps (A through F) indicated by an X are lighted for the frequency selected. Do not be concerned with indicator lamp G through O when performing this procedure.

Indicator lamps	Frequency setting of 10-megacycle selector																		
	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
A	X			X					X	X	X	X		X	X		X		X	
B		X			X					X	X	X	X		X	X		X		X
C	X		X			X					X	X	X	X		X	X		X	
D		X		X			X					X	X	X	X		X	X		X
E	X		X		X			X					X	X	X	X		X	X	
F	X	X	X	X		X	X		X		X		X			X				

(2) Set the 1/10-megacycle selector to any frequency in the 0.0- to 0.4-mc range. Set the whole-megacycle selector to each frequency listed in the following chart and observe that all of the indicator lamps (G

through K) indicated by an X are lighted for the frequency selected. Do not be concerned with indicator lamps A through F and L through O when performing this procedure.

Indicator lamps	Frequency setting of whole-megacycle selector									
	0	1	2	3	4	5	6	7	8	9
G	X	X		X	X			X		X
H	X	X	X		X	X			X	
I		X	X	X		X	X			X
J	X		X	X	X		X	X		
K		X		X	X	X		X	X	

(3) Set the 1/10-megacycle selector to any frequency in the 0.5- to 0.9-mc range. Set the whole-megacycle selector to each frequency listed in the following chart and observe that all of the indicator lamps (G through K) indicated by an X are lighted for the frequency selected. Do not be concerned with indicator lamps A through F and L through O when performing this procedure.

Indicator lamps	Frequency setting of whole-megacycle selector									
	0	1	2	3	4	5	6	7	8	9
G			X			X	X		X	
H				X			X	X		X
I	X				X			X	X	
J		X				X			X	X
K	X		X				X			X

(4) Set the 1/10-megacycle selector to each frequency listed in the following chart and observe that all of the indicator lamps (L through O) indicated by an X are lighted for the frequency selected. Do not be concerned with indicator lamps A through K when performing this procedure.

Indicator lamps	Frequency setting of 1/10-megacycle setting									
	0	1	2	3	4	5	6	7	8	9
L	X		X				X		X	X
M	X	X		X				X		X
N	X	X	X		X				X	
O		X	X	X		X				X

c. Transmit-Receive Control Circuit Test.

(1) Connect a microphone to the microphone jack in the aircraft. Set the function switch on the radio set control in the aircraft to any position except OFF and ADF.

(2) Press the push-to-talk button on the microphone and observe that the MIC KEY indicator lamp on the test

set lights. Release the push-to-talk button and observe that the indicator lamp goes out.

d. Stopping. After completing all desired tests, perform the stopping procedures (para 21), disconnect all the radio test set cables, and connect aircraft cabling connectors P1401 and P1403 to connectors J1401 and J1403 on the front panel of the radio set.

18. Checking Radio Set in Aircraft

a. Preliminary Operating Procedures (fig. 6).

(1) Place the test set near the front of the radio set that is installed in the aircraft. Remove the test set cover and all cables from the test set and then perform the preliminary control settings (para 16).

(2) Connect connectors P101 and P103 of cable CX-6673/U (7 ft) to connectors J101 and J103 (fig. 3) on the recessed top shelf of the test set.

(3) Disconnect aircraft cabling connectors P1401, P1403, and P1405 from connectors J1401, J1403, and J1405 on the front panel of the radio set.

(4) Connect connectors P106, P107, and P108 of cable CX-6673/U (7 ft) to connectors J1401, J1403, and J1405 respectively on the front panel of the radio set.

(5) Insert phone plug P109 of cable CX-6673/U (7 ft) in the METER jack on the front panel of the radio set.

(6) Connect clips P110 (red) and P111 (black) of cable CX-6673/U to a source of 27.5-volt dc power; observe polarity.

(7) Connect a headset to the PHONE jack and a microphone to the MIKE jack on the front panel of the test set (fig. 3).

b. Receiver Test. After the equipment is set up for operation (*a* above), proceed as follows to use the test set for testing the radio set receiver.

(1) Place the 27.5 VOLTS DC circuit breaker to ON. Observe that the STANDBY indicator lamp on the test set and the panel lamps on the radio set control light. Allow 10 minutes for the radio set to warm up.

(2) Set the function switch (fig. 4) on the radio set control on the front panel of the test set to the T/R position, place the meter switch on the front panel of the radio set in each of its positions and observe the indications on the test set meter. Typical meter indications are listed in the following chart. Actual readings may vary slightly from these typical indications.

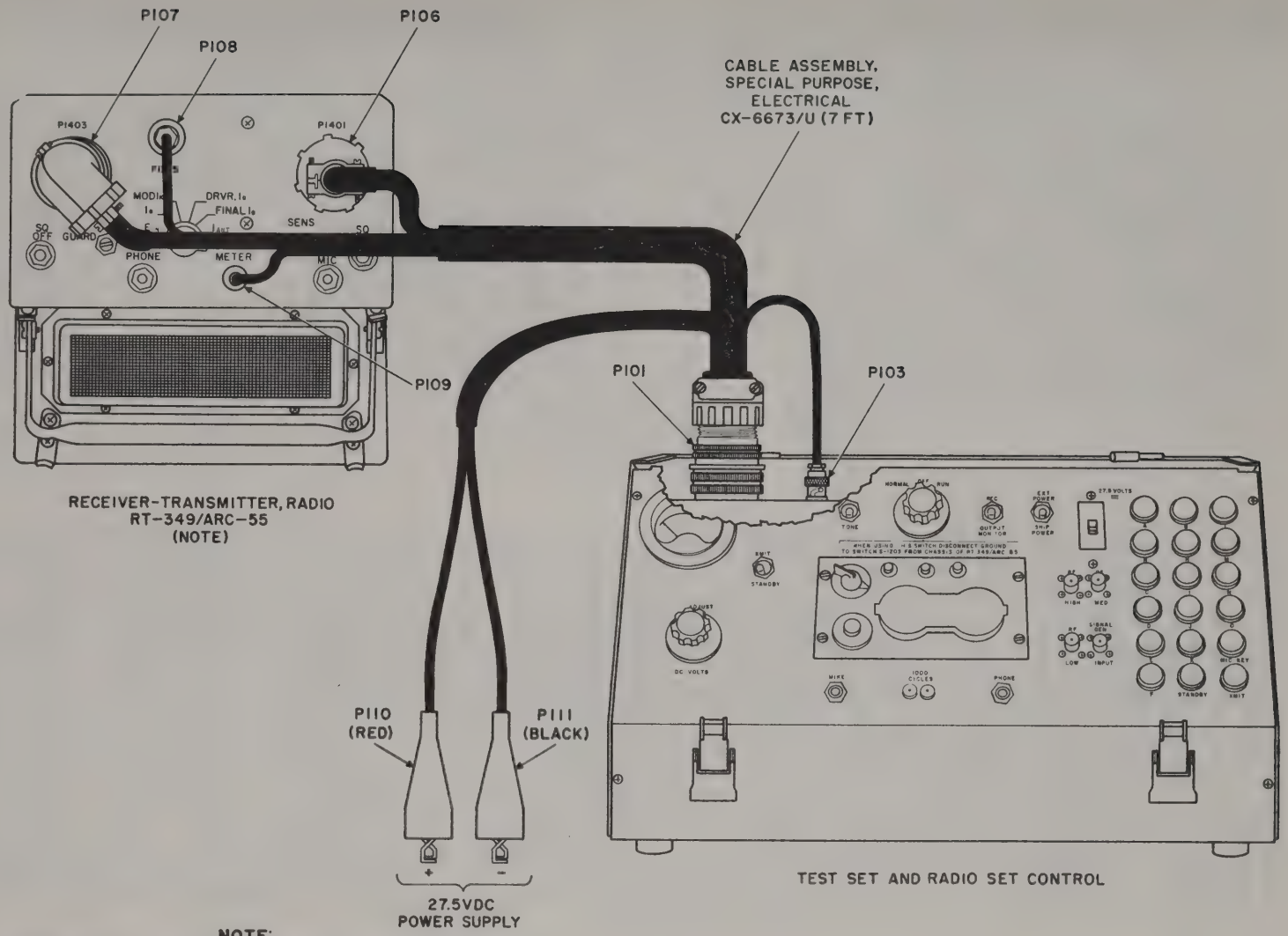
Meter switch position	Meter indication	Actual value
E_{IN}	0.54-0.56	27.5 volts
I_B	0.24-0.28	240-280 ma
MOD. I_K	0	0
DRVR. I_G	0	0
FINAL I_G	Small residual	-
I_{ANT}	0	0

(3) Set the function switch (fig. 4) on the radio set control on the front panel of the test set to T/R + G REC. Place the meter switch on the front panel of the radio set to I_B and observe the indication on the radio test set meter. This indication should be between 0.30 and 0.34. This is an actual value of 300 to 340 millamperes (ma). Return the radio set control function switch to T/R and the radio set meter switch to E_{IN}.

(4) Channel the receiver to 308.8 mc by means of the 10-megacycle, whole-megacycle, and 1/10-megacycle selectors on the radio set control of the test set.

(5) Set Signal Generator TS-497/URR, or equivalent, to 308.8 mc.

(6) Modulate the signal generator to 30 percent with a 1,000-cps signal. Adjust the signal generator output level for minimum signal output.



NOTE:

CONNECTORS ON RECEIVER—TRANSMITTER, RADIO RT-178/ARC-27 HAVE SAME DESIGNATION AND ARE LOCATED IN SAME RELATIVE POSITION.

Figure 6. Radio set test, cording diagram.

TM6625-418-12-6

(7) Connect the signal generator output cable to the SIGNAL GEN INPUT connector on the test set.

(8) Adjust the signal generator output level to 1,000 microvolts. Monitor the 1,000-cps modulation signal on the headset connected to the test set PHONE jack. Adjust the VOL control on the radio set control of the test set and observe that the audio output level varies.

Note. The 1,000-cps modulation signal also may be monitored with the headset connected to the test set PHONE jack.

(9) Channel the receiver to a new frequency and then to 308.8 mc by means of frequency selectors on the radio set control of the radio test set. Note that the audio disable circuits in the radio set prevents the 1,000-cps modulation signal from being heard until the frequency change cycle is completed.

(10) Perform other tests as required, by the testing and troubleshooting procedures in TM 11-5821-225-24.

(11) After completion of receiver testing and troubleshooting, perform the stopping procedures (para 21).

c. Transmitter Test. After the equipment is set up for operation (*a* above), proceed as follows to use the test set for testing the radio set transmitter.

(1) Place the 27.5 VOLTS DC circuit breaker (fig. 3) at ON. Observe that the STANDBY indicator lamp on the test set and the panel lamps on the radio set control light. Allow 10 minutes for the radio set to warm up.

(2) Press the push-to-talk button on the microphone to key the transmitter. Observe that the STANDBY indicator lamp on the test set goes out and the XMTR indicator lamp lights when the transmitter is keyed.

(3) Place the XMIT-STANDBY switch at XMIT for continuous transmitter keying. Observe that the XMTR indicator lamp remains lighted when the switch is in this position. Return the XMIT-STANDBY switch to STANDBY whenever continuous keying is not necessary.

(4) With the function switch (fig. 4) on the radio set control on the test set at T/R, place the meter switch on the front panel of the radio set under test in each of its positions and observe the indications on the test set meter (fig. 3) while the transmitter is keyed by one of the methods described in (2) and (3) above. Typical meter indications are listed in the following chart. Actual readings may vary slightly from these typical indications.

Meter switch position	Meter indication	Actual value
E_{IN}	0.54-0.56	27.5 volts
I_B	0.40-0.54	400-540 ma
MOD. I_K	0.25-0.40	50-80 ma
DRVR. I_G	0.3-0.8	15-40 ma
FINAL I_G	0.4-1.0	20-50 ma
I_{ANT}	0.3-0.95	10-25 watts

(5) Set Audio Oscillator TS-382C/U, or equivalent, to 1,000 cps. Turn the output level control on the audio oscillator fully counterclockwise. (The amplitude of the output signal will be 0 volt.)

(6) Place the meter selector switch (fig. 3) on the test set at 0-1VOLT. Connect the audio oscillator to 1000 CYCLES jacks J110 and J111. Turn the output level control clockwise until the amplitude of the output signal as read on the test set meter is 0.5 (center scale on the meter).

(7) Set the meter switch on the front panel of the radio set under test to MOD. I_K and the MIC-TONE switch (fig. 3) on the test set to TONE.

(8) Observe the indication on the test set meter. This indication should be between 0.5 and 0.7. This is an actual value of 100 to 140 ma.

(9) Set the REC-OUTPUT MONITOR switch on the test set to OUTPUT MONITOR and listen to the

1,000-cps signal on the headset connected to the test set PHONE jack.

(10) Set the MIC-TONE switch on the test set to MIC and press the push-to-talk button on the microphone connected to the MIKE jack to key the transmitter. Speak into the microphone while listening to the voice signal on the headset connected to the PHONE jack.

Note. The af signals monitored aurally in (9) and (10) above may be monitored visually as described in paragraph 20*d*.

d. Stopping. After completing all required tests, perform the stopping procedures (para 21), disconnect all the radio test set cables, and connect aircraft cabling connectors P1401 and P1403 to connectors J1401 and J1403 on the front of the radio set.

19. Bench—Checking Radio Set

a. Preliminary Operating Procedures (fig. 6).

(1) Place the radio test set and the radio set to be tested on a suitable workbench. Remove the test set cover and all cables from the test set and then perform the preliminary control settings (para 16).

(2) Connect connectors P101 and P103 of cable CX-6673/U (7 ft) to connectors J101 and J103 (fig. 3) on the recessed top shelf of the test set.

(3) Connect connectors P106, P107, and P108 of cable CX-6673/U (7 ft) to connectors J1401, J1403, J1405 respectively on the front panel of the radio set under test.

(4) Insert phone plug P109 of cable CX-6673/U (7 ft) in the METER jack on the front panel of the radio set.

(5) Connect clips P110 (red) and P111 (black) of cable CX-6673/U to the source of bench power (Power Supply PP-1104A/G or equivalent may be used); observe polarity.

(6) Connect a headset to the PHONE jack and a microphone to the MIKE jack on the front panel of the test set (fig. 3).

(7) Set the EXT POWER-SHIP POWER switch to EXT POWER.

Note. When using the test set on the bench, the EXT POWER-SHIP POWER switch must always be in the EXT POWER position.

b. Operating Procedures.

(1) Perform the radio set test procedures in paragraph 18*b* and *c*.

(2) For more detailed testing procedures, refer to paragraph 20.

(3) To troubleshoot the dynamotor, remove the dynamotor from the radio set main chassis and connect it to the main chassis by using extension cable CX-6669/U.

(4) To troubleshoot the radio set modulator, if. amplifier, audio amplifier, bias relay, or mechanical drive subassembly, remove the subassembly that is to be checked and connect the subassembly to the main chassis of the radio set by using extension cable CX-6668/U.

(5) To troubleshoot the radio set guard receiver, 20-30 mc if. amplifier, spectrum amplifier, or the rf power amplifier subassembly, remove the subassembly that is to be checked and connect the subassembly to the radio set main chassis by using extension cable CX-6672/U.

(6) To troubleshoot the radio set main receiver rf amplifier or the spectrum oscillator subassembly, remove the subassembly to be checked and connect it to the main chassis of the radio set by using extension cable CX-6670/U.

c. Stopping. After completion of all desired tests and troubleshooting procedures, perform the stopping procedures (para 21).

20. Special Operating Procedures

a. Testing Radio Set Under Reduced Voltage Conditions.

(1) Perform the preliminary control settings (para 16) and the preliminary operating procedures (para 18*a*).

(2) Set the 27.5 V DC-ADJUST DC switch (fig. 3) to ADJUST DC and the ADJUST DC VOLTS control at its midposition.
(3) Set the 27.5 VOLTS DC circuit breaker to ON. Observe that the STANDBY indicator lamp on the test set and the panel lamps on the radio set control light.
(4) Vary the ADJUST DC VOLTS control for the desired voltage input level to the radio set. Set the meter selector switch (fig. 3) on the test set to 0-1 MA and the meter switch on the front panel of the radio set to E_{IN} to measure the input voltage on the test set meter. A meter indication of 0.54 to 0.56 is an actual value of 27.5 volts.
(5) Refer to TM 11-5821-225-24 for maintenance procedures on the radio set.

b. Radio Set Alignment. When aligning the if. amplifier, spectrum amplifier, and rf power amplifier subassemblies of the main receiver in the radio set, drive the capacitor plates to accessible positions as follows:

(1) Perform the preliminary control settings (para 16) and the preliminary operating procedures (para 18*a*).
(2) Set the 27.5 VOLTS DC circuit breaker (fig. 3) to ON.
(3) Set the three manual decade frequency selectors (fig. 4) on the radio set control on the front panel of the test set to the frequency at which the radio set will be aligned.
(4) Set the radio set alignment control (fig. 3) on the test set to OFF.
(5) Drive the capacitor plates in the radio set to the desired position by holding the radio set alignment control in the RUN position. When the capacitor plates are in an accessible position, release the radio set alignment control. (It will return to OFF.)
(6) Refer to TM 11-5821-225-24 for alignment procedures on the radio set.
(7) After the alignment has been completed, place the radio set alignment control at NORMAL. The radio set will recycle to the preset frequency.

c. Receiver Sensitivity Adjustment.

(1) Perform the preliminary control settings (para 16) and the preliminary operating procedures (para 18*a*).
(2) Set the 27.5 VOLTS DC circuit breaker (fig. 3) to ON.
(3) Channel the receiver to 308.8 mc by using the manual decade frequency selectors (fig. 4) on the radio set control on the front panel of the test set. If the channels to be used are known, channel the receiver to the highest gain channel rather than 308.8 mc.
(4) Set Signal Generator TS-497/URR, or equivalent, to provide an rf output at the receiver frequency.
(5) Modulate the signal generator 30 percent with a 1,000-cps signal. Set the signal generator output level for minimum signal output.
(6) Connect the output of the signal generator to the SIGNAL GEN INPUT connector (fig. 3) on the test set.
(7) Refer to TM 11-5821-225-24 for preflight or bench tests and adjustments on receiver sensitivity.

Note. The guard receiver sensitivity adjustment is also made at this time as described in TM 11–5821–225–24.

d. Transmitter Modulation Characteristic Test.

(1) Perform the preliminary control settings (para 16) and the preliminary operating procedures (para 18*a*).
(2) Set the 27.5 VOLTS DC circuit breaker (fig. 3) ON.
(3) Set the Audio Oscillator TS-382C/U, or equivalent, to 1,000 cps. Turn the output level control fully counterclockwise. (The amplitude of the output signal will be 0 volt.)
(4) Set the meter selector switch (fig. 3) on the test set to 0-1 VOLT. Connect the audio oscillator output to the 1000 CYCLES jacks. Turn the

audio oscillator output level control clockwise until the amplitude of the output signal as read on the test set meter is 0.5.

(5) Connect the vertical plates of Oscilloscope OS-8C/U, or equivalent, direct to the RF HIGH, RF MED, or RF LOW connector. Select the connector that provides the proper rf output to the oscilloscope.

(6) Set the MIC-TONE switch (fig. 3) to TONE.

(7) Channel the transmitter to 225.0 mc by using the manual decade frequency selectors (fig. 4) on the radio set control on the front panel of the test set.

(8) Determine the percentage of modulation from the modulation envelope pattern on the oscilloscope. If necessary, adjust the gain control on the modulator subassembly as described in TM 11-5821-225-24.

21. Stopping Procedure

a. Set the 27.5 VOLTS DC circuit breaker (fig. 3) to OFF.

b. Disconnect CX-6673/U (7 ft) and/or CX-6671/U (6 ft 7 in.).

c. If there is no immediate need for the radio test set, place all cable assemblies in the storage compartment at the rear of the test set. Install, close, and fasten the test set cover.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

22. Scope of Maintenance Instructions

a. First Echelon Maintenance. First echelon maintenance of Test Set, Radio AN/ARM-51 consists of the following:

(1) Preventive maintenance (para 24).

(2) Visual inspection (para 25).

b. Second Echelon Maintenance. Second echelon maintenance of Test Set, Radio AN/ARM-51 consists of the following:

(1) Performing equipment performance check (para 26).

(2) Removal and replacement of Control, Radio Set C-1827/ARC-55 (para 27).

(3) Removal and replacement of indicator lamp lenses, indicator lamps, and panel lamps (para 28).

(4) Replacement of cable assemblies.

c. Higher Echelon Maintenance. If the radio test set cannot be repaired by performing the maintenance procedures in *a* and *b* above, higher echelon repair is required. Note on the repair tag what corrective measures were taken and how the equipment performed at the time of failure.

23. Tools and Materials Required

The tools and materials required for organizational maintenance consists of the following:

a. A small screwdriver for removing Control, Radio Set C-1827/ARC-55 from Test Set, Radio TS-1474/ARM-51.

b. Fine sandpaper, No. 000.

c. Clean, dry, lint-free cloth.

d. A dry, soft-bristle brush.

e. Cleaning Compound, Federal stock No. 7930-395-9542.

24. Preventive Maintenance

a. DA Form 11-266. DA Form 11-266 (fig. 7 and 8) is a preventive maintenance checklist to be used by organizational maintenance personnel. Items not applicable to the radio test set are lined out in the figures. References in the ITEM block in figure 8 are to paragraphs that contain additional maintenance information pertinent to the particular item. Instructions for use of the form appear on the form

b. Items. The information shown in this paragraph supplements DA Form 11-266. The item numbers correspond to the ITEM numbers on the form.

Item	Maintenance procedure
1	Use a soft-bristle brush and clean cloth to remove dust, dirt, moisture, and grease from the front panel surfaces and controls and from the case. If necessary, wet the cloth with cleaning compound and then wipe the parts with a clean, dry cloth.
3	Control knobs should work smoothly, be tight on the shafts, and should not bind. Tighten loose knobs and be sure that the knobs do not rub against the panel. Check the spring-return action of the radio set alignment control when set to RUN.
10	Use No. 000 sandpaper to remove rust and corrosion from exposed metal surfaces. Clean metal surfaces as described in item 1.

Warning: **Cleaning compound is flammable and its fumes are toxic. Do not use near a flame; provide adequate ventilation.**

25. Visual Inspection

a. When the equipment fails to perform properly, turn off the power and check the items listed below. Inspection will save repair time and may also avoid further damage. *Do not check any item with power applied.*

(1) Incorrect setting of switches and controls (para 16).

(2) Cables disconnected or poorly connected.

b. If the above checks do not locate the trouble, proceed to the equipment performance checklist (para 26).

MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
TEST EQUIPMENT
(AR 750-625)

EQUIPMENT NOMENCLATURE

TEST SET, RADIO AN/ARM-51

EQUIPMENT SERIAL NUMBER

107

INSTRUCTIONS

This form may be used for a period of one month by using the correct dates and weeks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.

1. For detailed Preventive Maintenance instructions see:
   a. The Technical Manual *(in TM 11 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   b. The Supply Bulletin *(SB 11-100 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   c. The Department of the Army Lubrication Order. *(See DA Pamphlet Number 310-4)*

2. The following action will be taken by either the Communications Officer/ Chief for 1st echelon, or the Inspector for higher echelon
   a. Enter Equipment Nomenclature and Serial Number.
   b. Strike out items that do not apply to the equipment.

3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.

4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.

FOLD

TYPE OF INSPECTION

OPER-ATOR	2/3 ECH-ELON	DATE	SIGNATURE
✓		7APR 61	R. Jones
	✓	7APR 61	J. Stone

Figure 7. DA Form 11-266, pages 1 and 4.

U. S. GOVERNMENT PRINTING OFFICE 1957 O—427138

DA FORM 1 MAY 57 11-266

LEGEND for marking conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, (X).

DAILY CONDITION FOR MONTH OF

NO.	DAILY ITEM	1 17	2 18	3 19	4 20	5 21	6 22	7 23	8 24	9 25	10 26	11 27	12 28	13 29	14 30	15 31	16	2D 3D ECHELON
1.	CLEAN DIRT AND MOISTURE FROM EXPOSED SURFACES OF ~~HOUSINGS~~; CASES, ~~CABINETS~~; CONTROL PANELS, INTERCONNECTING PLUGS, CABLES, ~~HEADSETS~~, METER WINDOWS, ETC. PARA 22b	✓	✓	✓	✓	✓	✓	✓										
2.	INSPECT FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS SWITCHES, KNOBS, JACKS, CONNECTORS AND PILOT LIGHTS.	✓	✓	✓	(X)	✓	✓	✓										
3.	INSPECT CONTROLS FOR BINDING, SCRAPING. TAP CONTROLS LIGHTLY FOR CUT-OUT DUE TO LOOSE CONTACTS. PARA 22b	✓	✓	✓	✓	✓	✓	✓										
4.	DURING OPERATION BE ALERT FOR ANY UNUSUAL PERFORMANCE OR CONDITION.	✓	✓	✓	✓	✓	✓	✓										

WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D 3D ECH
5. INSPECT CORDS, CABLES, WIRE ~~AND SHOCK MOUNTS~~ FOR BREAKS, CUTS, KINKS, DETERIORATION, STRAIN AND FRAYING.	X					X
6. ~~INSPECT CANVAS AND LEATHER ITEMS FOR FUNGUS, FRAYING, TEARS, BROKEN ZIPPERS AND SNAP FASTENERS.~~						
7. HAND CHECK FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS HANDLES, LATCHES, HINGES.	✓					✓
8. ~~INSPECT FOR LUBRICATION IN ACCORDANCE WITH APPLICABLE DA LUBRICATION ORDER.~~						
9. ~~INSPECT DRY BATTERIES FOR DIRT, LOOSE TERMINALS AND LEAKAGE.~~						
10. INSPECT EXPOSED METAL SURFACES FOR RUST AND CORROSION. PARA 22b	✓					✓
11. INSPECT METERS FOR DAMAGED GLASS AND CASES.	✓					✓

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
12. INSPECT SEATING OF READILY ACCESSIBLE ITEMS OF A PLUCK-OUT NATURE: ~~CRYSTALS, FUSES~~; CONNECTORS, ~~PLUG-IN COILS~~, LAMPS, ETC. DO NOT REMOVE, ROCK OR TWIST TO INSPECT. USE ONLY A DIRECT PRESSURE TO INSURE THE ITEM IS FULLY SEATED. PARA 26	✓
13. ~~INSPECT FOR CLEANLINESS AND TIGHTNESS OF SUCH ITEMS AS SHOCK MOUNTS, ANTENNA, ANTENNA MOUNTS AND WAVE GUIDES.~~	
14. ~~INSPECT RELAY AND CIRCUIT BREAKER ASSEMBLIES FOR DIRT, CORROSION, WORN OR BURNED CONTACTS.~~	

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
15. ~~INSPECT RESISTORS, BUSHINGS, INSULATORS FOR CRACKS, CHIPPING, BLISTERING, DISCOLORATION AND MOISTURE.~~	
16. INSPECT JACKS AND CONNECTORS FOR SNUG FIT AND GOOD CONTACTS.	✓
17. ~~INSPECT VARIABLE CAPACITORS FOR DIRT AND MOISTURE.~~	
18. ~~INSPECT AIR FILTERS FOR CLEANLINESS.~~	
19. ~~INSPECT SCREW-TYPE TERMINALS OF TRANSFORMERS, FIXED CAPACITORS, RESISTORS, CHOKES, POTENTIOMETERS AND RHEOSTATS FOR CORROSION, DIRT AND LOOSE CONTACTS.~~	
20. ~~CLEAN AND TIGHTEN SWITCHES, BLOWERS, RELAY CASES; CLEAN INTERIOR OF CHASSIS AND CABINETS.~~	
21. ~~INSPECT GENERATORS, MOTORS AND DYNAMOTORS FOR BRUSH WEAR, SPRING TENSION, ARCING AND COMMUTATOR WEAR.~~	
22. ~~INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS AND BREAKS.~~	
23. ~~INSPECT GASKETS AND BUSHINGS FOR WEAR AND DAMAGE.~~	
24. ~~INSPECT CATHODE RAY TUBES FOR BURNED SCREEN SPOTS.~~	
25. ~~BEFORE STORING OR SHIPPING REMOVE ALL BATTERIES.~~	

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION. *(Continue on page 4, if more space is needed)*

ITEM 5. BATTERY CLIP BROKEN FROM CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-6673/U. REPORTED TO FOURTH ECHELON FOR REPAIR.

2 3

TM6625-418-12-8

Figure 8. DA Form 9-266, pages 2 and 3.

26. Equipment Performance Checklist

a. General. The equipment performance checklist provides a procedure for systematically checking equipment performance. The *Action* column lists the switch and control settings to be made. The *Normal indication* column lists the normal visible signs that the repairman should expect during each step. When abnormal indications are noted, the repairman should perform the recommended corrective measures listed in the *Corrective measures* column. The *Corrective measures* column lists only the maintenance duties that the second echelon repairman can perform without turning the equipment in for higher echelon repair. Perform the corrective measures in the order listed. If higher echelon repair is required, note on the repair tag how the equipment performed at the time of failure and what corrective measures were taken.

b. Checklist.

	Step	Action	Normal indication	Corrective measures
PREPARATORY	1	Perform the preliminary control settings (para 16).		
	2	Connect connector P102 of cable CX-6671/U to connector J103 (fig. 3) on the recessed top shelf of the test set (fig. 5).		
	3	Connect connector P101 of cable CX-6673/U to connector J101 (fig. 3) on the recessed top shelf of the test set (fig. 6).		
	4	Connect connectors P112 and P113 of cable CX-6671/U (fig. 5) to connectors P107 and P106 respectively of cable CX-6673/U (fig. 6).		
	5	Connect clips P110 and P111 of cable CX-6673/U (fig. 6) to a source of 27.5 volts dc; observe polarity.		
	6	Set the EXT POWER-SHIP POWER switch (fig. 4) to EXT POWER.		
	7	Set the 10-megacycle selector (fig. 4) to 20.		
	8	Set the whole-megacycle selector to 0.		
	9	Set the 1/10-megacycle selector to 0.		
EQUIPMENT PERFORMANCE	10	Set the 27.5 VOLTS DC circuit breaker (fig. 3) to ON.	Panel lamps on the radio set control (fig. 4) and indicator lamps A, C, E, F, G, H, J, L, M, and N on the test set (fig. 3) light.	If any panel lamps remain unlighted, while one or more indicator lamps light, replace defective panel lamps (para 28). If all lamps remain unlighted, proceed to step 11. If some of the indicator lamps remain unlighted, replace defective lamps (para 26), cable CX-6673/U (7 ft), cable CX-6671/U (6 ft 7 in.), and/or the radio set control (para 27). If the wrong combination of indicator lamps lights, check the lamp combinations for various frequencies as described in step 13. Higher echelon repair required.

	Step	Action	Normal indication	Corrective measures
EQUIPMENT PERFORMANCE	11	Set the EXT POWER-SHIP POWER switch (fig. 3) to SHIP POWER.	Panel lamps on the radio set control (fig. 4) and indicator lamps A, C, E, F, G, H, J, L, M, and N on the test set (fig. 3) should go out.	If any or all of the lamps light with the switch at SHIP POWER, when all lamps remain unlighted in EXT POWER position, the switch requires higher echelon repair. IF all lamps remain unlighted, remove the radio set control from the test set (para 27) and check to see that the connector at the rear of the radio set control is securely connected. If this does not correct trouble, replace cable CX-6673/U (7 ft), cable CX-6671/U (6 ft 7 in.), 27.5-volt dc power supply, and/or the radio set control. Higher echelon repair required.
	12	Set the 10-megacycle selector to 39 and the 1/10-megacycle selector to .5 (fig. 4)	Indicator lamps B, D, I, K, and O on the test set (fig. 3) light and remaining indicator lights are extinguished.	If some of the indicator lamps remain unlighted, replace defective lamps (para 28), cable CX-6673/U (7 ft), cable CX-6671/U (6 ft 7 in.), and/or the radio set control. If the wrong combination of indicator lamps lights, check the lamp combinations for various frequencies as described in step 13. Higher echelon repair required.
	13	Set the 10-megacycle, whole-megacycle, and 1/10 megacycle selectors (fig. 4) to various frequency settings.	Indicator lamps (fig. 3), followed by an X in the charts in paragraph 17*b*, light for the frequency selected.	Replace the radio set control (para 27), cable CX-6673/U (7 ft), and/or cable CX-6671/U (6 ft 7 in.). Higher echelon repair required.
	14	Set the XMIT-STANDBY switch (fig. 3) to XMIT then return the switch to STANDBY. Set the MIC-TONE switch to TONE, then return the switch to MIC.	Indicator lamp MIC KEY on the test set (fig. 3) lights whenever the XMIT-STANDBY switch is at XMIT and the MIC-TONE switch is at TONE.	If the indicator lamp remains unlighted, replace the defective lamp (para 28), cable CX-6673/U (7 ft), cable CX-6671/U (6 ft 7 in.), and/or the radio set control (para 27). Higher echelon repair required.
	15	Set the 10-megacycle selector to 27, the whole-megacycle selector to 1, and the 1/10-megacycle selector to .5 (fig. 4).	Indicator lamps E, J, and O light.	Replace defective lamps (para 28).
	16	Substitute the indicator lamp from the STANDBY lampholder in the E lampholder (para 28). Place the indicator lamp removed from the E lampholder in the empty STANDBY lampholder.	Indicator lamp installed in E lampholder lights.	Replace indicator lamp installed in E lampholder.
	17	Substitute the indicator lamp from the XMIT lampholder in the O lampholder (para 28). Place the indicator lamp removed from the O lampholder in the empty XMIT lampholder.	Lamp installed in the O lampholder lights.	Replace defective lamp installed in the O lampholder.

	Step	Action	Normal indication	Corrective measures
STOP	18	Set the 27.5 VOLTS DC circuit breaker to OFF.		
	19	Disconnect all cables that were connected in steps 2 through 5.		
	20	Place all cables, running spares, and technical manuals in the rear compartment of the radio test set (fig. 3).		

27. Removal and Replacement of Radio Set Control
(fig. 9)

a. Removal.

(1) Loosen the four retaining screws on the left and right edges of the radio set control front panel.
(2) Pull the radio set control out far enough from the test set front panel to gain access to the cable connector at the rear.
(3) Disconnect the cable connector from the connector at the rear of the radio set control.

b. Replacement.

(1) Place the radio set control in front of the opening in the center of the test set front panel.
(2) Connect the cable and cable connector, fastened inside the test set, to the connector at the rear of the radio set control.
(3) Place the radio set control in the test set front panel opening.
(4) Tighten the four retaining screws on the left and right edges of the radio set control front panel.

28. Removal and Replacement of Indicator and Panel Lamps
(fig. 9)

a. Removal and Replacement of Indicator Lamps.

(1) Unscrew (counterclockwise) the glass indicator jewel and remove it to expose the lamp.
(2) Press in one the lamp and turn it counterclockwise to unlock.
(3) Remove the lamp from its lampholder.
(4) Insert the new lamp in the lampholder.
(5) Push the lamp in and twist it clockwise to lock.
(6) Screw (clockwise) the glass indicator jewel into the lampholder.

b. Removal and Replacement of Panel Lamps.

(1) Unscrew (counterclockwise) and remove the panel lamp mounting base.
(2) Remove the lamp from the panel lamp mounting base.
(3) Insert the new lamp in the panel lamp mounting base.
(4) Screw (clockwise) the panel lamp mounting base back into its socket.

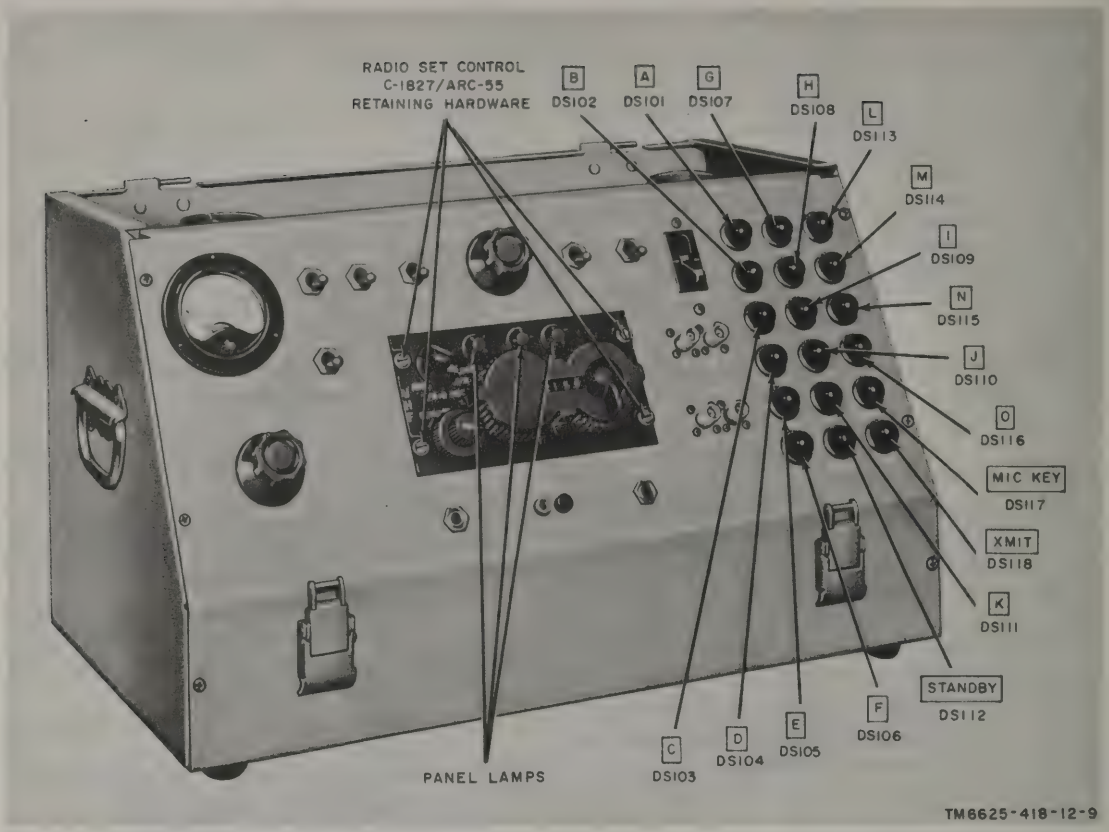


Figure 9. Radio set control retaining hardware, panel lamp, and indicator lamp location.

CHAPTER 5
SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

29. Disassembly of Equipment

a. Disconnect all cable assemblies.

b. Place the cable assemblies, the spare parts, and two technical manuals in the storage compartment at the rear of the test set. If a third technical manual is not available, obtain necessary information from paragraph 30 before packing the technical manuals.

c. Close and fasten the test set cover.

30. Repacking for Shipment or Limited Storage

The exact procedure for repackaging depends on the material available and the conditions under which the equipment is to be shipped or stored. Adapt the procedure outlined below whenever circumstances permit. The information concerning the original packaging (para 12) will also be helpful.

a. Material Requirements. The following materials are required for packaging the radio test set. For stock numbers of materials, consult SB 38-100.

Material	Quantity
Waterproof paper	25 sq ft
Waterproof tape	25 ft
Corrugated cardboard	25 sq ft
Corrugated filler	50 sq ft
Gummed tape	25 ft

b. Packaging.

(1) Package the radio test set within a close-fitting bag fabricated of waterproof paper. Seal the bag with waterproof tape.

(2) Use the corrugated cardboard to form a carton large enough (14-1/4 by 14-1/2 by 21-1/2 inches) to hold the radio test set.

(3) Place a 1-1/2 inch thick corrugated filler pad in the bottom of the carton. Carefully place the radio test set in the carton and fill the space on each side and the top with corrugated filler pads.

(4) Close the carton and seal with gummed tape.

Section II. DEMOLITION OF MATERIAL TO PREVENT ENEMY USE

31. Authority for Demolition

The demolition procedures given in paragraph 32 will be used to prevent the enemy from using or salvaging this equipment. Demolition of the equipment will be accomplished only upon the order of the commander.

32. Methods of Destruction

The size and construction of the radio test set particulary lends itself to destruction by smashing and cutting. It is preferable to demolish completely some portions of the radio test set rather than to partially destroy the complete radio test set.

a. Use sledges, axes, hammers, crowbars, or any heavy tool available to smash the test set, the test cover, and the radio set control. If time permits, remove the radio set control from the test set before smashing.

b. Use axes, handaxes, machetes, or similar tools to cut each cable assembly in a number of places.

c. Bury or scatter destroyed parts or throw them into nearby waterways.

d. Burn technical manuals.

APPENDIX I

REFERENCES

SB 38-100	Preservation, Packaging, and Packing Materials, Supplies, and Equipment Used by the Army
TM 11-1214A	Oscilloscope OS-8C/U
TM 11-2684A	Audio Oscillators TS-382A/U, TS-382B/U, TS-382D/U, and TS-382E/U
TM 11-5030A	Signal Generators TS-497/URR and TS-497C/URR
TM 11-5126	Power Supplies PP-1104A/G and PP-1104B/G
TM 11-5821-210-12P	Operator's and Organizational Maintenance Repair Parts and Special Tools Lists and Maintenance Allocation Chart for Radio Sets. AN/ARC-55, AN/ARC-55A, and AN/ARC-55B
TM 11-5821-225-10	Operator's Manual, Radio Sets AN/ARC-27, AN/ARC-27A, AN/ARC-55, and AN/ARC-55B
TM 11-5821-225-24	Organizational and Field Maintenance Manual, Radio Sets AN/ARC-27, AN/ARC-27A, AN/ARC-55, and AN/ARC-55B

APPENDIX II
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. General

a. This appendix assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon.

b. Columns in the maintenance allocation chart are as follows:

(1) *Part or component.* This column shows only the nomenclature or standard item name. Additional descriptive data are included only where clarification is necessary to identify the part. Components and parts comprising a major end item are listed alphabetically. Assemblies and subassemblies are in alphabetical sequence with their components listed alphabetically immediately below the assembly listing.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelon capable of performing the operations.

(a) Service. To clean, to preserve, and to replenish fuel and lubricants.

(b) Test. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(c) Replace. To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.

(d) Repair. To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes but is not limited to inspecting, cleaning, preserving, adjusting, replacing, welding, riveting, and straightening.

(e) Align. To adjust two or more components of an electrical system so that their functions are properly synchronized.

(f) Rebuild. To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances and/or specifications and subsequent reassembly of the item.

(g) Overhaul. To restore an item to completely serviceable condition as prescribed by serviceability standards developed and published by heads of technical services. This is accomplished through employment of the technique of *Inspect and Repair Only as Necessary* (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.

(3) *1st, 2d, 3d, 4th, 5th, echelon.* The symbol X indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation.

(4) *Tools required.* This column indicates codes assigned to each individual tool equipment, test equip-

ment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks.* Entries in this column will be utilized when necessary to clarify any of the data cited in the preceding columns.

c. Columns in the allocation of tools for maintenance functions are as follows:

(1) *Tools required for maintenance functions.* This column lists the tools, test, and maintenance equipment required to perform the maintenance functions.

(2) *1st, 2d, 3d, 4th, 5th echelon.* The dagger (†) symbol indicates the echelons allocated the facility.

(3) *Tool code.* This column lists the tool code assigned.

2. Mounting Hardware

The basic entries of the maintenance allocation chart do not include mounting hardware such as screws, nuts, bolts, washers, brackets, clamps, etc.

3. Maintenance by Using Organizations

When this equipment is used by signal services organizations organic to the theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

Section II. MAINTENANCE ALLOCATION CHART

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH.	(4) 2ND ECH.	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
TEST SET RADIO AN/ARM-51 (Formerly Maintenance Kit MK-429()/ARC)	service	X						
	test				X		1,2,3,4	
	replace		X					
	repair				X			Refurbish
	align				X			
	rebuild					X		
CONTROL RADIO SET C-1827/ARC-55	replace		X					See Separate MAC
	repair				X			
	overhaul					X		
COVER TEST SET, CW-570/ARM-51	replace		X					
	repair				X			Refurbish
TEST SET, RADIO TS-1474/ARM-51	replace		X					
	repair				X			Refurbish
	rebuild					X		
ADAPTER	replace			X				
AMMETER	replace			X				
CABLE ASSEMBLY, SPECIAL PURPOSE ELECTRICAL	replace	X						
CABLE	replace			X				
CONNECTOR	replace			X				
CAPACITOR, FIXED, MICA DIELECTRIC	replace			X				
CAPACITOR, FIXED, PAPER DIELECTRIC	replace			X				
CATCH, FRICTION	replace				X			

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH.	(4) 2ND ECH	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
AN/ARM-51 (continued)								
CIRCUIT BREAKER	replace			X				
CLIP BATTERY	replace			X				
CONNECTOR PLUG ELECTRICAL	replace			X				
CONNECTOR RECEPTACLE ELECTRICAL	replace			X				
COVER CONNECTOR	replace			X				
GROMMET, RUBBER	replace			X				
INSULATOR	replace			X				
JACK, TELEPHONE	replace			X				
JACK, TIP	replace			X				
KNOB	replace		X					
LAMP, INCANDESCENT	replace		X					
LENS, INDICATOR LIGHT	replace		X					
PLUG, TELEPHONE	replace			X				
RELAY, ARMATURE	replace			X				
RESISTOR, FIXED, COMPOSITION	replace			X				
RESISTOR, VARIABLE	replace			X				
SEMI-CONDUCTOR DEVICE DIODE	replace			X				
SHIELD, CONNECTOR	replace			X				
SWITCH, ROTARY	replace			X				
SWITCH TOGGLE	replace			X				
TERMINAL, LUG	replace			X				
TERMINAL BOARD	replace				X			
WIRE ELECTRICAL	replace				X			

Section III. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

(1) TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	(2) 1ST ECH	(3) 2ND ECH	(4) 3RD ECH.	(5) 4TH ECH	(6) 5TH ECH	(7) TOOL CODE	(8) REMARKS
AN/ARM-51 (continued)							
MULTIMETER AN/URM-105				†	†	1	
TEST SET, CRYSTAL TS-873/U				†	†	2	
METER TEST EQUIPMENTS TS-682/GSM-1				†	†	3	
TOOL KIT TK-871				†	†	4	

APPENDIX III
BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

1. General

a. This appendix lists items supplied for initial operation and for running spares. The list includes tools, accessories, parts, and material issued as *part of* the major end item. The list includes all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

b. Columns are as follows:

(1) *Source, maintenance, and recoverability code.* Not used.

(2) *Federal stock number.* This col- lists the 11-digit Federal stock number. In the absence of a Federal stock number, an interim number, for example,†† L8Ra41C-12 in the *Description* column, indicates that a Federal stock number is being processed for assignment. The L number may be used in emergencies to identity items.

(3) *Designation by model.* Not used.

(4) *Description.* Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description.

(5) *Unit of issue.* The unit of issue is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

(6) *Expendability.* Expendable items are indicated by the letter X; nonexpendable items are indicated by NX.

(7) *Quantity authorized.* Under *Items Comprising an Operable Equipment*, the column lists the quantity of items supplied for the initial operation of the equipment. Under *Running Spares and Accessory Items,* the quantities listed are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenace of the equipment.

(8) *Illustrations.* Not used.

2. Critical Items

A zero slash (Ø) in the *Description* column indicates items that are expected to fail during the first year or items that will make the equipment inoperative if they fail.

Section II. FUNCTIONAL PARTS LIST

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS FIGURE NO	(9) ILLUSTRATIONS ITEM NO
			ITEMS COMPRISING AN OPERABLE EQUIPMENT					
			TEST SET RADIO AN/ARM-51					
	6625-753-1922		TEST SET, RADIO AN/ARM-51: test for AN/ARC-27 and AN/ARC-55; oper dc, 0 to 1 ma range ±2-1/2%; Collins No. 522-8904-004	ea	NX			
	5820-524-2187		CONTROL RADIO SET, C-1827/ARC-55	ea	NX	1		
			COVER TEST SET CW-570/ARM-51: Collins No. 522-8904-004 †† LORc38-2	ea	X	1		
			TEST SET RADIO, TS-1474/ARM-51: †† LORc38-2	ea	X	1		
			TEST SET, RADIO TS-1474/ARM-51					
			CABLE ASSEMBLY SPECIAL PURPOSE ELECTRICAL; CX-6668/U: 25-1/2 in; Collins No. 563-0427-003 †† LORc38-4	ea	NX	1		
			CABLE ASSEMBLY, SPECIAL PURPOSE ELECTRICAL; CX-6669/U: 27-1/4 in; Collins No. 563-0417-002 †† LORc38-5	ea	NX	1		
			CABLE ASSEMBLY, SPECIAL PURPOSE ELECTRICAL; CX-6670/U: 24 in; Collins No. 563-0418-002 †† LORc38-6	ea	NX	1		
			CABLE ASSEMBLY, SPECIAL PURPOSE ELECTRICAL; CX-6671/U: 77 in; Collins No. 563-0436-004 †† LORc38-7	ea	NX	1		
			CABLE ASSEMBLY SPECIAL PURPOSE ELECTRICAL; CX-6672/U: 24-1/2 in; Collins No. 563-0423-003 †† LORc38-8	ea	NX	1		
			CABLE ASSEMBLY, SPECIAL PURPOSE ELECTRICAL; CX-6673/U: 90 in; Collins No. 563-0440-004 †† LORc38-9	ea	NX	1		

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS FIGURE NO	(9) ILLUSTRATIONS ITEM NO
			AN/ARM-51 (continued)					
			RUNNING SPARES AND ACCESSORY ITEMS					
			TEST SET RADIO AN/ARM-51					
			TEST SET, RADIO TS-1474/ARM-51					
	6240-012-7934		0 LAMP INCANDESCENT: 28 v, 4.76 w, 0.17 amp; T-3-1 4; GE No. 313	ea	X	18		DS-101 thru DS-118

END

By Order of the Secretary of the Army:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

To be distributed in accordance with DA Form 12–7 requirements for TM 11 Series (UNCLAS) Plus the following Formula:

USASA (2)	11–5
CNGB (1)	11–6
Tech Stf, DA (1) except	11–7
CSigO (18)	11–16
DASA (5)	11–55
US ARADCOM (2)	11–56
US ARADCOM Rgn (2)	11–57
MDW (1)	11–98
Seventh US Army (2)	11–117
EUSA (2)	11–155
Units org under fol TOE: (2 copies	11–500 (AA–AE) (4)
each except as indic)	11–557
7	11–587
	11–592
	11–597
	17

NG: State AG (3); Units Same as Active Army except allowance is one copy to each unit.
USAR: None.
For explanation of abbreviations used, see AR 320–50.